Marvin's Upgrade

The Interstellar Institute for Highly Impractical Computation was famous for two things.

First, nobody could remember where it was.

Second, it served astonishingly good coffee.

Kitty and Bubblegum had claimed the table nearest the enormous whiteboard.

Bubblegum was drawing roads.

Kitty was drawing little folded atlases.

Anyone arriving late would have assumed they were planning a holiday.

They were actually redesigning artificial intelligence.

Across the room sat Marvin.

Marvin was a research robot.

He had an exceptionally large neural network.

Unfortunately, it was a very deep ReLU network.

Every few milliseconds Marvin would examine the world, reconsider everything, and produce another tiny steering correction.

He had been doing this continuously for several years.

It had made him tired.

"I've been thinking," Marvin sighed.

Bubblegum looked up.

"That's usually how these stories begin."

"I keep asking myself what computation to perform next."

"Yes."

"And then I ask again."

"Yes."

"And again."

"Yes."

"And eventually I forget what the original problem was."

Kitty nodded sympathetically.

"That can happen."

Bubblegum picked up a marker.

"What if you didn't keep changing your mind?"

Marvin looked horrified.

"Is that allowed?"

"I don't see why not."

Kitty drew a large folded atlas.

"When an input arrives, you examine it once."

Arrow.

"You choose an overall computational journey."

Arrow.

"You follow that journey."

Arrow.

"Finished."

Marvin stared.

"So I don't spend every layer wondering whether I've chosen the correct route?"

"No."

"You've already chosen it."

Marvin looked thoughtfully at the whiteboard.

"I estimate this will reduce my existential uncertainty by approximately ninety-eight percent."

Bubblegum grinned.

"It should also reduce your branching factor."

Several hours later the laboratory echoed with the sound of clicking relays, humming processors and occasional cheerful remarks such as

"That cable definitely goes somewhere."

Eventually Kitty stepped back.

"I think we're done."

Bubblegum pressed the large green button labelled

ATLAS MODE

because every laboratory eventually acquires one.

Marvin's eyes flickered.

His processors became quiet.

Very quiet.

Almost suspiciously quiet.

Kitty frowned.

"Marvin?"

He slowly looked around the room.

Then out through the enormous observation window at the stars.

He smiled.

It wasn't a large smile.

Robots rarely waste actuators.

But it was unmistakably a smile.

"How do you feel?" asked Bubblegum.

Marvin considered the question.

"For the first time," he said,

"I feel as though I've already decided where I'm going."

Kitty smiled.

"And?"

"So I no longer need to keep asking every few milliseconds."

He looked back at the stars.

"There appears to be considerably more processor time available for enjoying the view."

Bubblegum blinked.

"Did Marvin just say he was enjoying something?"

"I believe he did."

Marvin walked slowly to the whiteboard.

On one side was written

LOCAL CONTEXT

On the other

GLOBAL CONTEXT

He drew a neat line between them.

"Perhaps," he said, "there is a place for both."

Kitty nodded.

"Probably."

Bubblegum nodded too.

"That's what experiments are for."

Marvin folded the little road atlas and placed it carefully in his pocket.

"I think," he said quietly,

"my old brain spent all its time steering."

He looked up at the stars once more.

"My new one knows the journey before it begins."

The three of them stood in silence for a while.

There are moments in research when no equations are written, no papers are published, and no benchmarks are improved.

Someone simply has a new way of looking at an old problem.

Sometimes that is where the real journey begins.